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EXAMINER
LEE, J

E5M1/0215

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ART UNIT	PAPER NUMBER
2501	7

DATE MAILED: 02/15/96

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☐ This application has been examined. ☒ Responsive to communication filed on December 12, 1995 ☒ This action is made final.

A shortened statutory period for response to this action is set to expire THREE (3) month(s), ----- days from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice re Patent Drawing, PTO-948.
3. ☒ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of informal Patent Application, Form PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____

Part II SUMMARY OF ACTION

1. ☒ Claim(s) 17 - 38 are pending in the application.
   Of the above, claim(s) _____ are withdrawn from consideration.
2. ☒ Claim(s) 1 - 16 have been canceled.
3. ☒ Claim(s) 17, 18, 21, and 22 are allowed.
4. ☒ Claim(s) 19, 20, and 23 - 38 are rejected.
5. ☐ Claim(s) _____ are objected to.
6. ☐ Claim(s) _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawing(s) under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawing(s) are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable. ☐ not acceptable (see explanation or Notice re Patent Drawing, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____ has (have) been ☐ approved by the examiner. ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction(s), filed on _____, has been ☐ approved. ☐ disapproved (see explanation).
12. ☐ Acknowledgment is made of the claim for priority under 35 USC 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____ ; filed on _____.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☒ Other The Information Disclosure Statement filed August 17, 1995, has been considered (note attached form PTO-1449).

EXAMINER'S ACTION

Applicant's communication filed on December 12, 1995, has been carefully considered by the Examiner. The objections to the disclosure and abstract have been obviated and are hereby withdrawn. The amendments have also resulted in the allowance of claims 17, 18, 21, and 22, as will be explained below, but the remaining claims must be rejected as set forth hereinafter.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 23-30, 32, 33, and 37 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 23, line 19, and in claim 28, line 18, the term "said end" is unclear since two ends of the rotating fiber-optic cable have been defined. It is believed that --said other end-- is the intended term. All claims dependent on claims 23 and 28 inherently contain the same deficiency and are therefore included in the rejection. In line 2 of each of claims 32, 33, and 37, there is no antecedent support for "the measured light signal".

The following is a quotation of the first paragraph of 35 U.S.C. § 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by

the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. § 112, first paragraph, as failing to adequately teach how to make and/or use the invention, i.e. failing to provide an enabling disclosure. Newly presented claims 31-38 require that the common leg of the bifurcated fiber-optic cable be connected at one end to an electrical slipring. This new claim limitation is based upon a statement on page 11, lines 22-25, of the disclosure that the rotating optical coupler (which was adequately described) can be replaced with other types of couplers, including electrical sliprings. No further description of the use of an electrical slipring is, however, offered. The substitution of an electrical slipring for a rotating optical coupler is not a simple replacement task. While the use of a rotating optical coupler involves purely optical signal transmission, the use of an electrical slipring involves the conversion of optical to electrical signals, as well as the conversion of electrical to optical signals. There is no indication whatsoever in the specification, in either general or specific terms, of the necessary elements (or their arrangement) for such conversion to operatively occur. The person of ordinary skill in the art would be at a loss as to how to effect the use of an electrical slipring in combination with the bifurcated fiber-optic cable as set forth in claims 31-38. The disclosure is therefore non-enabling for the embodiment represented by these claims.

Claims 31-38 are rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth above in the objection to the specification.

Claims 19, 20, and 23-30 are rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent 3,510,667 to Cleveland et al. Cleveland et al discloses precisely the same optical monitoring apparatus claimed by applicant: note the bifurcated fiber-optic cable having a common leg and two bifurcated legs; the rotating fiber-optic cable with two ends; the light source (not shown) connected to bifurcated leg 26a; the means for analyzing a light signal (not shown) connected to bifurcated leg 26b; and the rotating coupler having a stator and a rotor, the common leg of the bifurcated fiber-optic cable being connected to the stator and one end of the rotating fiber-optic cable being connected to the rotor. The other end of the rotating fiber-optic cable is held in close proximity to the article being inspected.

The only differences between the device being claimed by applicant and that disclosed by Cleveland et al are (1) Cleveland et al does not disclose the exact distance between the surface of the article being inspected and the other end of the rotating fiber-optic cable, and (2) Cleveland et al does not state that the inspection apparatus is used in combination with a chemical mechanical polishing device. The second of these two differences would have been clearly obvious to the ordinarily skilled artisan

in view of the teaching of Cleveland et al (column 1 of the patent) that the patented apparatus is useful during manufacturing of practically every article sold in commerce. A reading of the patent makes it clear that the Cleveland et al apparatus can detect minute flaws, imperfections, and defects (optically) on the surface of an article, and this capability would make it ideally suited to the monitoring of film planarization (i.e. during film polishing). The first difference is one of degree, and as such would have been obvious to the person of ordinary skill in the art. Any person skilled in manufacturing technologies would understand that the inspection end of an optical fiber cable could only be placed so close to the surface of the article being inspected/manufactured. This distance would vary depending on the manufacturing technique being employed. Therefore, a claim limitation specifying that the distance is a particular amount (e.g. less than one centimeter) does not impart patentability in and of itself. Such a claim, considered as a whole with the apparatus which it further limits, represents an embodiment which would have been entirely obvious to the person of ordinary skill in view of the disclosure of Cleveland et al.

Applicant's arguments filed December 12, 1995, with respect to the rejection based upon the Cleveland et al reference, have been fully considered but they are not deemed to be persuasive. Applicant's argument that Cleveland et al is not related to the

field of chemical mechanical polishing is understood, but this does not mean that the optical device of the reference could not be used in many different applications; this was explained in the body of the rejection (above). Applicant cannot obtain a patent on a device that has been known and used for over 25 years simply by attaching a slightly different use to such device, particularly when the intended use is so obviously close to its original use (see the rejection above). It is important to understand that applicant's broadly worded claims provide no details for a "chemical mechanical polishing device" other than the fiber optic inspection/measuring device; it is really just the fiber optic device (with its attendant details) that is being claimed. The rejection has clearly explained how such device is unpatentable in view of Cleveland et al. Applicant's argument regarding dependent claims 26 and 30 is nonpersuasive since the "dedicated measurement area" relates to the article being inspected/measured by the claimed device; it does not form a part of the combination being claimed. Further, the term "dedicated measurement area" is merely a label and does not actually limit the claimed device. Applicant's argument regarding dependent claim 27 is nonpersuasive for the same reason ("dedicated measurement area" relates to the article being inspected/measured by the claimed device). In addition, since articles are inspected by the Cleveland et al apparatus in an assembly line fashion, there certainly is "timed interval illumination" therein.

Finally, applicant's argument regarding the use of particular wavelengths (dependent claims 24, 25, and 29) is non-persuasive since these are not **specific** wavelengths as alleged but rather wavelength **ranges**, all of which are in the optical portion of the spectrum. Since the Cleveland et al device is an optical device, the use of any optical wavelength would clearly have been obvious to the person of ordinary skill in the art.

Claims 17, 18, 21, and 22 are allowable over the prior art of record. Independent claims 17 and 21 are patentably distinct from Cleveland et al because they specifically include, respectively, "means for analyzing a light signal to determine thickness change and stopping thickness change when the thickness reaches a predetermined endpoint" and "means for analyzing a light signal based on interferometry or spectrophotometry".

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The U.S. Patent to van Pham et al shows another optical film thickness measurement system using a bifurcated optical fiber cable and a rapid scanning monochromator with a rotating diffraction grating.

Applicant's amendment necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL.** See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS

ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

Any inquiry concerning this communication should be directed to Examiner John D. Lee at telephone number (703) 308-4886.

John D. Lee

JOHN D. LEE
PRIMARY PATENT EXAMINER
GROUP ART UNIT 251